Better Buildings®
SUMMIT

AUGUST 21-23, 2018 • CLEVELAND, OHIO

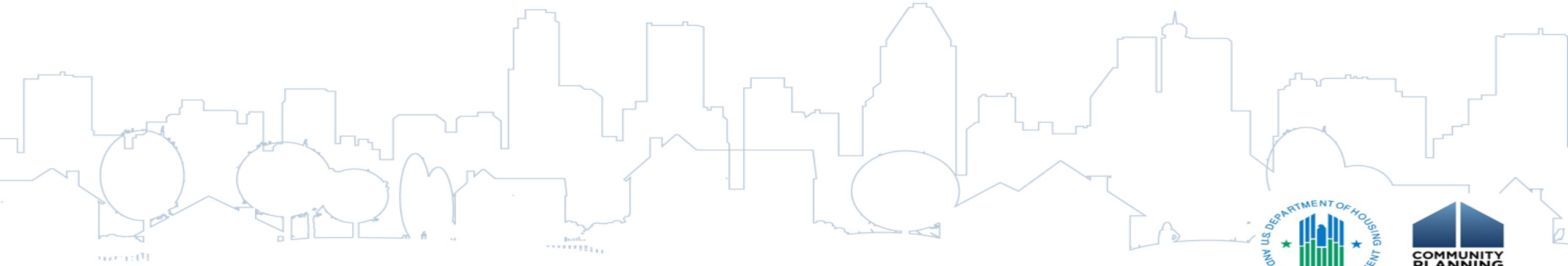
Getting a Running Start

Tools to Build Capacity for Measurable Progress

Energy Exchange | Better Buildings SUMMIT

Affordable Housing Utility Benchmarking Pilot

Summer 2017



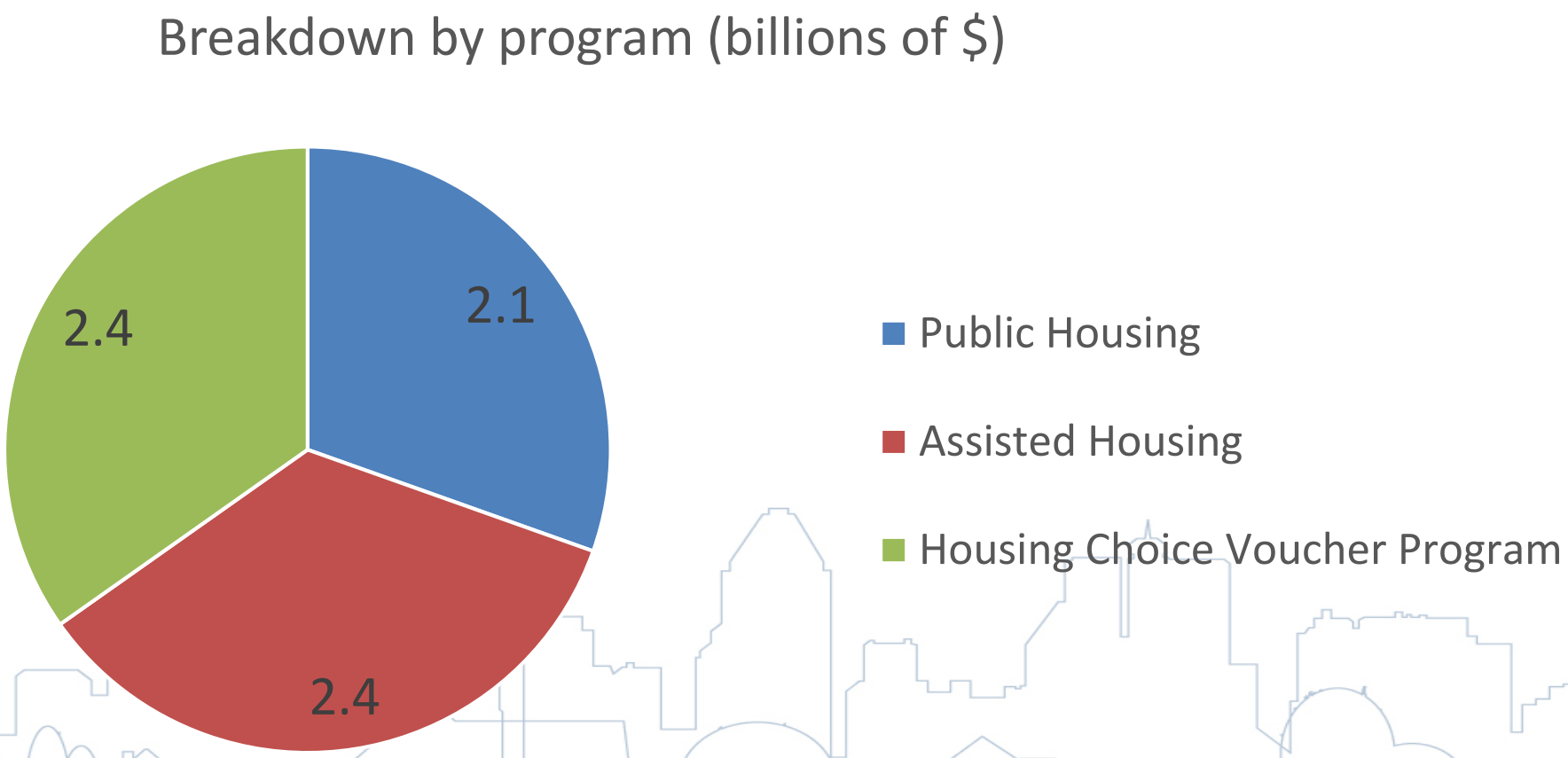
We spend *how* much?

- Each year, HUD spends a growing amount – now estimated at over **$7 Billion/year** – to cover utilities costs for 4.5 million affordable housing units.
  - Housing providers spend over 20% of the funds HUD provides them on utility costs.
  - The poorest performing buildings spend 3-7 times as much as the highest performing buildings.

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

COMMUNITY PLANNING & DEVELOPMENT

$6.9 billion in Utility Expenditures



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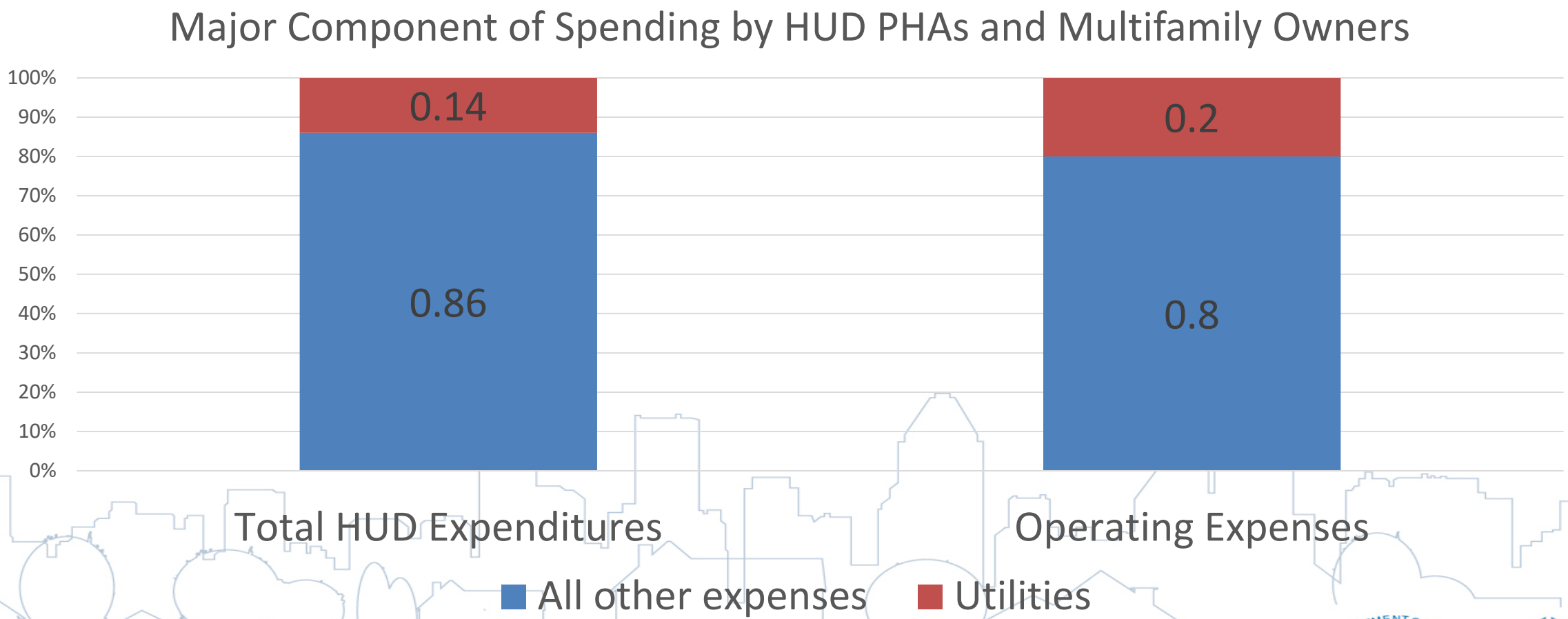
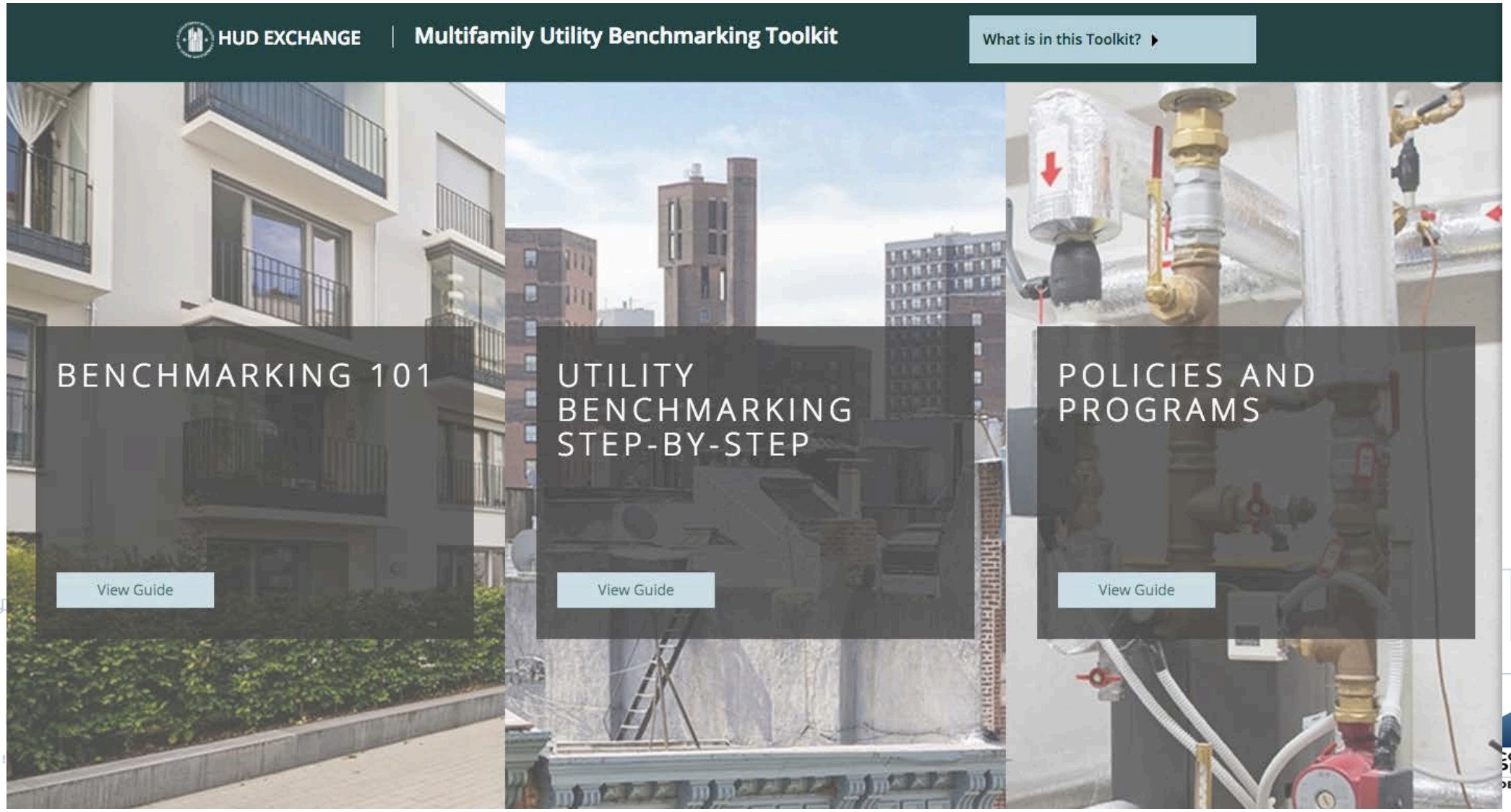


Barriers to Utility Cost Reduction

- Split Incentives
- Financing/Complicated Capital and approval structures
- Inability to track utility data consumption
- Lack of Staff Capacity
- Utilities not a priority because they are a “hidden” expense

Utility Benchmarking Technical Assistance



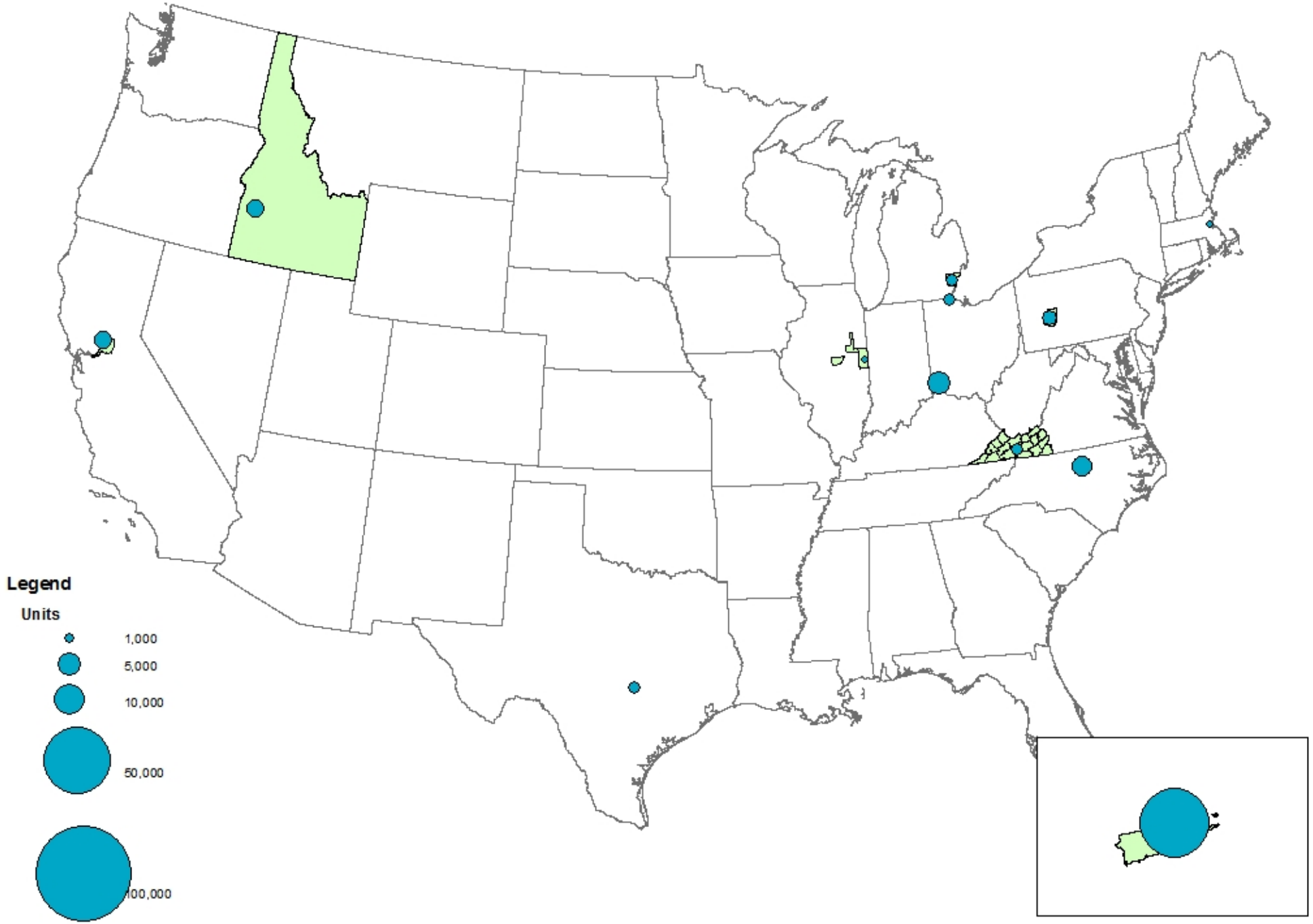
Program Background

- Major barrier to utility benchmarking is **lack of capacity** to gather and manage utility data
  - Last summer, we partnered with the Environmental Defense Fund's (EDF) Climate Corps program to place 12 graduate students fellows in locations around the country

EDF CLIMATE CORPS

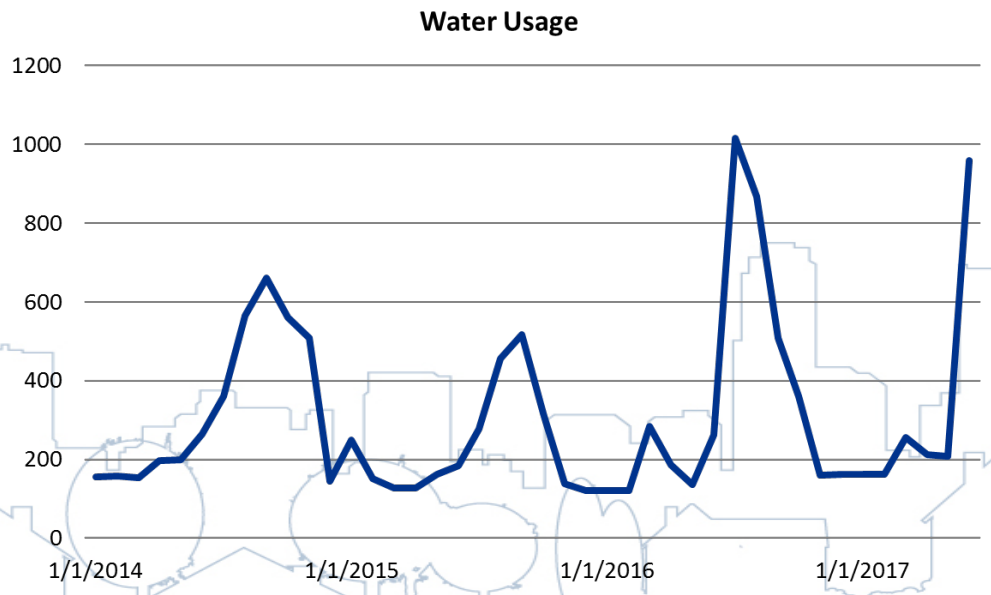
Application and Selection

- Looking for a mix of participants who would
  - create high volume
  - present unique challenges (e.g. rural, scattered site)
  - result in overall program and geographical diversity
- Tried to ensure that the host-site supervisors had both the seniority and the bandwidth to maximize the fellows' productivity


Legend
Units
1,000
5,000
10,000
50,000
100,000

Program Impact

- 69,672 new benchmarked units
- Approximately 1,880 new benchmarked buildings



- 7 out of 12 fellows established new data-sharing arrangements between their host site(s) and utility providers
- Increased interest in BBC and the EPC programs

Lessons Learned

- While some fellows were able to make very specific project-level recommendations, others had to use all of their available time just to complete the process of benchmarking
- Fellows experienced numerous barriers while conducting benchmarking for the first time:
  - Data quality control and entry
  - Some PHAs had not collected tenant release forms
  - Lack of intra-agency coordination
  - Rural-specific challenges

Key Recommendations

- Investing in utility data management software to increase coordination and alleviate redundancy
- Establishing cross-cutting utility teams

Housing Authority of the City of San Buenaventura

SUSTAINABILITY INITIATIVES AND CAPACITY BUILDING

HACSB Sustainability Commitment

- A role beyond shade and shelter – Building and maintaining healthy communities
- 2013 Better Buildings Challenge Commitment
- 2014 Civic Spark Fellowship
- Growth and Diversification of Sustainability initiatives
  - HACSB Sustainability Task Force
  - Green building design and construction
    - USGBC LEED for HOMES, LEED Neighborhood Development
    - CalGreen building code
    - Renewable energy
    - Greywater
    - Materials ie vinyl windows versus fiberglass or composite
  - Resident engagement
  - Portfolio Benchmarking
  - Food forward and access to fresh produce
  - Energy efficiency and RAD conversions

CivicSpark Fellowship Impacts

2014 - 2015

- **Initial Research**
  - **BBC**
  - **LEED**
  - **O&M training**
- **Began gathering all utility data**
- **WegoWise**
- **Sustainability Team**

2015 - 2016

- **Ongoing:**
  - **BBC**
  - **Utility data**
  - **Wegowise**
  - **Sustainability team**
- **LEED- ND**
- **Rebates**
- **Food Forward & Community Gardens**

2016 - 2017

- **Ongoing:**
  - **BBC**
  - **Utility Data**
  - **Wegowise**
  - **Food Forward**
- **Lease update**
- **Energy Star Portfolio Manager (ESPM)**

2017 - 2018

- **Established 2013 baseline data**
- **Captured whole building data (2017) - AB 802**
- **ESPM Data QC**
- Launched the Ventura Pop-up Free Farmers' Market
- Resident Outreach- Healthy Homes Initiative

Challenges, Opportunities

- BBC purpose, strategy, baseline consumption
- Investment of resources – staff time, space/cost, training and fellow turnover
- Leadership commitment
- Utility data… to what end?
  - Resident authorizations
  - AB 802 facilitated access to resident utility consumption data
  - Keeping up with portfolio changes & impacts to utility data set-up and management
- Agency wide participation and commitment to sustainability
- Limited access to peer network and best practices
- Site specific utility allowances for a HACSB net zero project were higher than Section 8 utility allowances due to water ($0 for gas/electricity)
- Indoor greywater reuse – cost, regulatory constraints; limited payoff with greywater for irrigation purposes
- Competing “environmental priorities” – vinyl windows, greywater, solar

Sustainability – What lies ahead for HACSB

- Sustainability coordinator
- Water
- Resident and operations team engagement and education
- Beyond BBC – how can sustainability initiatives save costs and contribute to the larger mission of housing preservation and affordable housing production?
- Backlash to going green – water saving measures, higher electrical costs

Building Green Communities:
Setting and achieving environmental targets through team integration

Lauren Zullo, LEED AP O+M
Director of Sustainability
Better Buildings Summit | Energy Exchange
August 23, 2018

15,000
units

86
properties

11.4M
sq.ft.

13
states


New Development
Acquisitions & Investment
Asset Management
Property Management
Investor Relations

Qualifications

- Undergrad degree in Sustainability, Enviro Studies, Business, Eng.
- 2-5 yrs Sustainability Experience
- Real Estate Experience Preferred
- Knowledge of EGC and/or LEED

Candidates

- Targeted schools and specific green job sites
- Received 100+ applicants in 2 wks
- Pre-screen with HR
- Interviewed 8 candidates

Program

- 10 week program, May – Aug
- 1-2 interns per Biz Practice
- Direct report to Sr. Manager
- Outings, Lunch & Learns
- Collaboration btwn interns
- Interaction with all Directors

Projects

- Flexible depending on skillset and goals – establish early on
- Resiliency Assessment
- Property Baseline and Goal Setting
- CapEx Planning
- Impact Report, Case Studies

Reduce ENERGY USE
20% from baseline

Reduce EMISSIONS
20% from baseline

Reduce WATER USE
15% from baseline

Increase
WASTE DIVERSION
15% from baseline

Grand Lowry Lofts

Report Period	Q1 2018
Fund Group	RAHP Fund IV
Asset Manager	Nicholas Maloney
Property Manager	Michael Olson

Peer Group Index Comparison

	Energy (kBTU/sqft)	Water (kGal/bdrm)
Your Index	50	66
Avg. Index	48	92
% Difference	4%	-28%

Percent Change - Usage

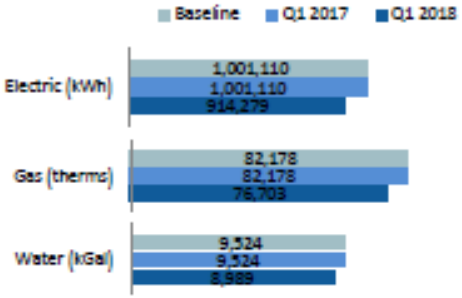
Fuel Type	Baseline v. Q1 2018	Q1 2017 v. Q1 2018
Electric	-9%	-9%
Gas	-7%	-7%
Water	-6%	-6%

Percent Change - Spend

Fuel Type	Baseline v. Q1 2018	Q1 2017 v. Q1 2018
Electric	-5%	-5%
Gas	2%	2%
Water	7%	7%

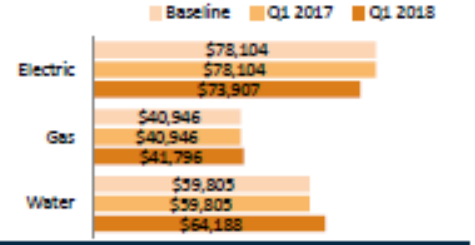
Usage (Weather Normalized)

Fuel Type	Baseline 2016	Q1 2017	Q1 2018
Electric (kWh)	1,001,110	1,001,110	914,279
Gas (therms)	82,178	82,178	76,703
Water (kGal)	9,524	9,524	8,989



Spend

Fuel Type	Baseline 2016	Q1 2017	Q1 2018
Electric	$ 78,104	$ 78,104	$ 73,907
Gas	$ 40,946	$ 40,946	$ 41,796
Water	$ 59,805	$ 59,805	$ 64,188



Energy Events

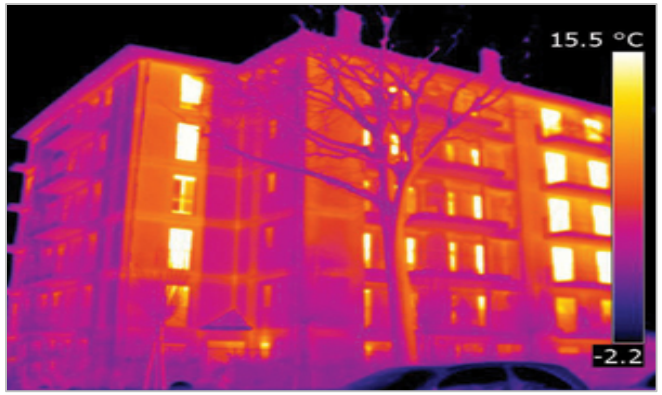
Event Type	Date Implemented	Cost	Annual Savings
Lighting - In-Unit Lighting- Upgrade		$ 24,250	$ 13,900
Water - Low-Flow Faucets/Showerheads- Install		$ 18,250	$ 6,500
Appliances - ENERGY STAR Washing Machines- Install/Upgra		$ -	$ 1,800
Water - Low Flush Toilets- Install		$ 125,250	$ 9,300
Ventilation - Exhaust Fan- Install/Upgrade		$ 8,500	$ 1,800
Pumps/Motors - High-Efficiency/VFD Pumps/Motors-Install	10/31/2017	$ 28,750	$ 5,900
Water - Irrigation Conservation System -Install/Upgrade		$ 3,500	$ 400
Pumps/Motors - High-Efficiency/VFD Pumps/Motors-Install		$ 2,000	$ 200
Pumps/Motors - High-Efficiency/VFD Pumps/Motors-Install		$ 24,500	$ 1,700

Where is Energy Use Intensity?

…*What* is EUI???

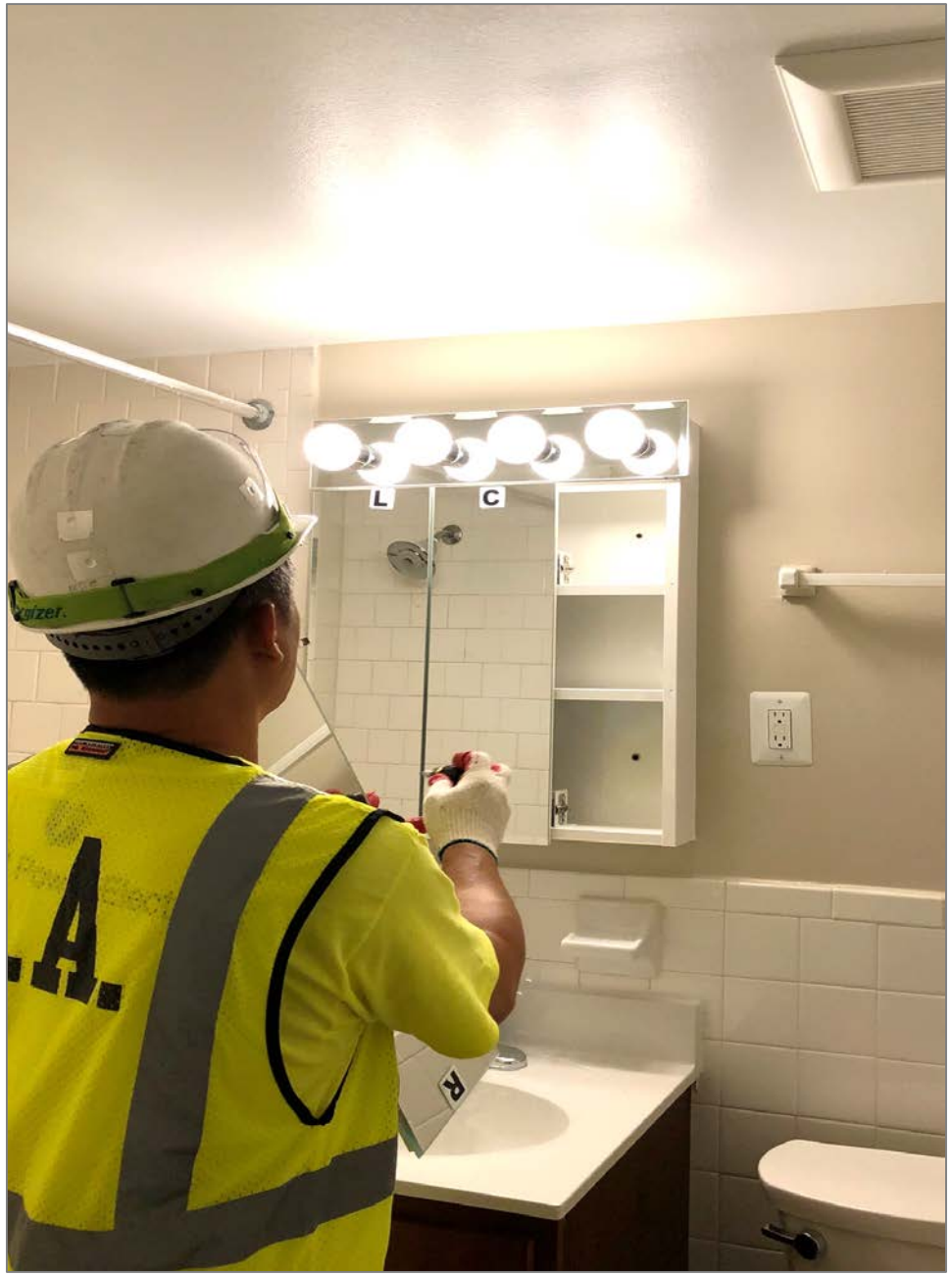

Environmental Commitments
Baseline
Q2 2018
Target
Energy Use Intensity
(kBTU/sqft/yr)
reduce by 20% within 10 years
49
44
39
Water Use Intensity
(kGal/bdrm/day)
reduce by 15% within 10 years
147
125
106
Emissions Intensity
(MLbs CO2/yr)
reduce by 20% witin 10 years
1.45
1.31
1.16

Turned static information into usable format



Recommendation		Cost and Savings							Financial Performance				
ECM	Description	Initial Investment ($)	Cash Incentives** ($)	Tax Incentives ($)	Annual Savings ($)	Owner Savings ($)	Tenant Savings ($)	Source Energy Savings (%)	Life	Simple Payback	SIR	Return on Investment	Net Present Value
1	Install a 185 kW PV Solar System	($528,000)	$312,000	$250,000	$22,500	$22,500	$0	N/A	25	5.1	9.1	4%	$342,521
2	Install Low-Flow Faucet Aerators and Showerheads	($28,750)	$0	$0	$40,000	$40,000	$0	2.1%	10	0.7	11.1	139%	$289,304
3	Install a 35 kW CHP System	($175,000)	$0	$51,500	$19,600	$19,600	$0	N/A	25	6.5	2.3	11%	$159,840
4	Install Low-Flow Toilets	($190,000)	$0	$0	$35,900	$35,900	$0	0.0%	10	5.0	1.6	20%	$105,900
5	Upgrade Common Area Lighting and Controls	($91,500)	$0	$0	$22,400	$22,400	$0	5.8%	10	4.1	1.9	24%	$96,596
6	Replace Common Area Washing Machines	($750)	$0	$0	$5,200	$5,200	$0	0.0%	14	0.2	71.0	693%	$52,494
7	Upgrade In-Unit Lighting	($127,750)	$0	$0	$19,700	$0	$19,700	5.2%	10	6.5	1.2	15%	$29,041
8	Replace DHW Circulation Motors	($2,000)	$0	$0	$1,000	$1,000	$0	0.3%	15	1.9	5.4	50%	$8,618
9	Install DCV on RTUs	($19,750)	$0	$0	$2,600	$2,600	$0	1.0%	15	7.5	1.4	13%	$8,594
10	Reduce Domestic Hot Water Temperature Setpoint	($750)	$0	$0	$3,200	$3,200	$0	1.7%	3	0.2	11.8	427%	$8,135
11	Seal Mechanical Rooms	($2,750)	$0	$0	$700	$0	$0	0.2%	15	4.1	2.6	25%	$4,402
12	Repair In-Unit Water Leaks	($4,000)	$0	$0	$1,100	$1,100	$0	0.6%	5	3.8	1.2	28%	$923
13	Install Vending Misers	($1,000)	$0	$0	$200	$200	$0	0.1%	8	4.4	1.2	20%	$168
14	Upgrade Common Area Condensers	($16,750)	$0	$0	$1,000	$1,000	$0	0.3%	20	18.4	0.8	6%	($3,375)
	Project Summary: Without P4P Incentives	**($1,178,750)**	**$312,000**	**$301,500**	**$175,100**	**$154,700**	**$19,700**	**17%**	**-**	**3.2**	**2.9**	**15%**	**$1,093,361**


ited States
Gulf of California
Gulf of Mexico



- **Standalone projects** with clear deliverables. This is key to demonstrating ROI.
- **Integration** with other teams, e.g. asset management, so others can see value of the work product
- **Transition planning**, whether handoff or full-time offer
- **Social and educational programming** to understand the business

Thank You!

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